




Horizontally sliding door.**Publication number:** EP0173829**Publication date:** 1986-03-12**Inventor:** MALKMUS-DOERNEMANN**Applicant:** MALKMUS DOERNEMANN CAROLA**Classification:**





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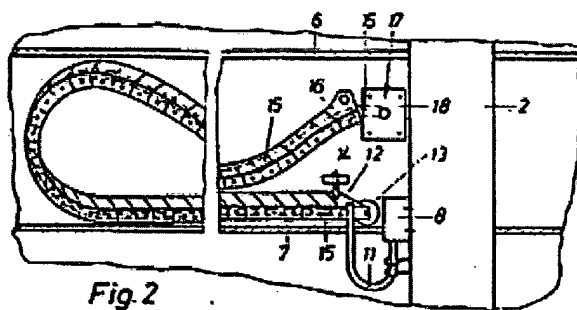
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 GB2093513
 DE2743007
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1. A sideways sliding gate, which has a framework (3) which is box-like in cross-section, with electrical conductors arranged therein for control and indicator devices, and which is guided by stationary uprights on the framework (3) a guide rail (6) running in the gate's longitudinal direction, which guide rail encloses a guide channel, which is rectangular in cross section, for the accommodation of an energy supply chain (7) in the form of a stud-link chain of plastics and at least one electrical cable (15) contained therein, in that one end of the chain is fixed with respect to the longitudinally movable gate, guided in the guide rail, and the associated end of the cable held in the chain is guided through a longitudinal slot (10 or 20) of the guide rail and connected to a current supply device (8) connected to the upright (2), while the other end of the chain is secured on the framework and the associated end of the cable is passed through a window (17) in the wall of the framework and also connected to the electrical conductors provided in the framework, the chain and cable forming a loop enclosed by the guide rail in the open position of the gate.

**Fig. 2**

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Side sliding gate the invention concerns a side sliding gate, which exhibits a stretcher belt with conductions for control and indicator plants, arranged box shaped in the cross section, therein, and is led at stationary posts.

There is side sliding gates of aforementioned kind in the most different execution forms well-known, for example as cantilever side sliding gates, which over the gate opening-broad is extended outside and is through at the gate extension attacking Stützund guide rollers held in the closed condition. Variations in type are held in the gate posts, whereby frequently in double posts arranged supporting and guide rollers are intended, which attack at the upper and Untergurt of the gate.

For the Eetrieb of such side sliding gates a set of control and indicator plants are needed, which among other things also serve the accident prevention. So the gates are to be equipped with indicator plants, which show clearly whether the gate is in motion and/or. whether the Tora impulse is operated or not. Such indicator plants can consist for example of turn signals, which are distributed arranged at into the gate opening putting forward the end of the gate or however in or reciprocally along the stretcher belt. Usually side sliding gates are equipped henceforth with pressure controlled limit switches, which < with reaching the closing position of the gate; RTI ID=2.1> betestigt< /RTI> and those will serve also the accident prevention at the same time, in order to stop the drive of the gate, if the gate is moved against a resistance in the gate opening. These control and indicator plants important for the working reliability and the reduction of the danger of accident over conductions are usually fed, which are accommodated in the box shaped stretcher belt of the gate. The current feed to these conductions been made with well-known remarks of the side sliding gates usually by sliding contacts or < RTI ID=2.2> Sharpening cable, < /RTI> the two are relatively trouble-prone.

With < RTI ID=2.3> Schleifkontakten< /RTI> the further difficulty that parallel to the side sliding gate in appropriate foundations a Stromzuführungsschiene than stationary current inlet must be arranged, insists on which arms outstanding from the stretcher belt with appropriate sliding contacts pushes away. Beside a very large up < RTI ID=2.4> --< /RTI> the disadvantage wound in purchase be taken for this kind of the current feed must during this execution that interruptions of circuit can occur, which are unavoidable with less frequent manipulation of the gate by oxidation of the sliding contacts. During a current feed by means of trailing cables it is necessary to make a separate accommodation of the trailing cable outside of the gate so that also for this a substantial building expenditure is necessary. In the case of a current feed by means of trailing cables, which are up and are completed on a winding device, additional expenditures for the manipulation of the winding drum as a function of the gate manipulation result. Also during arrangement of a winding drum it is necessary to accommodate the cable moved with the gate in an appropriate protecting casing which must extend over the entire dragging way of the cable.

The invention is the basis the task to train a side sliding gate of the kind introductory specified so < RTI ID=3.1> aae< /RTI> the current feed to the control and indicator plants over the conductions with an extraordinarily small expenditure and a largest security against susceptibility to interference, arranged in the stretcher belt, is ensured.

For the solution of managing task the side sliding gate introductory specified marks itself according to invention by the fact that laterally at the stretcher belt one < in; RTI ID=3.2> Torlängsrichtung< /RTI> running guide rail is intended, which < in the cross section a rectangular; RTI ID=3.3> Führungskanal< /RTI> for the admission of an energy guidance chain in the form of a bar link chain from plastic and at least an electrical cable held therein it encloses that end of the chain is stationarily opposite the lengthwise-mobile gate in the guide rail led and the associated end of the cable held in the chain is attached to a current feed mechanism connected with the post passed through a lengthwise slot of the guide rail and, while the other end of the chain is fastened to the stretcher belt and < RTI ID=3.4> zugehörige< /RTI> End of the cable passed through a window in the wall of the stretcher belt as well as with the conductions planned in the stretcher belt is connected, whereby the chain and that Cables in the Offenstellung of the gate a loop umschlossene of the guide rail form.

Although the energy guidance chains mentioned under the designation < RTI ID=4.1> Kabelschlepp< /RTI> for more than 25 years world-wide admits and to the supply of mobile parts in machine tools and such in particular. used, such bar link chains in connection with side sliding gates are so far no application found, because by the professional world it was not obviously recognized that such chains are suitable by Schiebetoren with the described accommodation in along the stretcher belt running channel also for the current supply of the control and indicator plants, if the current feed likewise specified < over a stationary connected with the post; RTI ID=4.2> Stromzuführungseinrichtung< /RTI> taken place.

Via according to invention planned the training a protected accommodation of the bar link chain and the cable held therein takes place whereby the bending radius of the cable is determined with the manipulation of the gate by the bar link chain and by appropriate choice of the bar link chain be adjusted in such a way can that one < RTI ID=4.3> Überbean < /RTI> spruchung the cable by bending loads is avoided and thus an interruption of circuit is prevented. Takes place via the described training a stationary connection cable end at the current feed mechanism of the post, while the other end is connected likewise again firmly with the conductions running in the stretcher belt. The disadvantages and dangers of the interruption of circuit with security, arising with sliding contacts, are prevented by the fixed connections of the two cable ends. For the cable only the guide rail necessary, so that also the additional protection device necessary planned at the stretcher belt on use of a trailing cable is except half the gate as well as if necessary. necessary up and completion mechanisms for < RTI ID=5.1> Schleppkabel< /RTI> not applicable. Since the cable which can be accommodated in the bar link chain can exhibit a relatively small electrically leading cross section for the current feed, it is possible to use a relatively narrow bar link chain so that also the guide rail can be trained relatively narrowly and thus at the stretcher belt of the gate hardly remarkably into action goes. Practical attempts showed that a bar link chain from 1,5 to 2 cm broad completely for the admission < RTI ID=5.2> Stromführungskabels< /RTI> to Steuerungsund indicator plants is sufficient, and < RTI ID=5.3> dae< /RTI> by < RTI ID=5.4> Biegeradius< /RTI> the cable and the chain certain height of the guide rail in an order of magnitude of 12 to 15 < RTI ID=5.5> Art< /RTI> completely is sufficient. Attempts with a side sliding gate and a guide rail in the aforementioned order of magnitude showed that even after several ten thousand < RTI ID=5.6> Bewegungsspielen< /RTI> no impairment of the current feed and also no damage of the cable took place.

< RTI ID=5.7> Zweckrr.äg< /RTI> is it, if as box profile the trained < RTI ID=5.8> Führer, gsschiene< /RTI> the lengthwise slot in the torabgewandten side wall exhibits as well as in a apron-like flexibly ductile sealing strip pointing with his free longitudinal fold downward is covered. The end of the cable connected with the current feed mechanism in the post can be passed through for example a pipe resistant to bending connected with the post, which is firmly connected the gap up to the end of the energy guidance chain, held mentioned by the post by, in relation to longitudinal movements of the gate stationarily in the guide rail extended and with this end.

With another execution form it is intended that the guide rail designed as box profile exhibits the along slot in the wall pointing downward, and that in the side walls of the guide rail with the window in the stretcher belt aligning windows are intended, by which the window is provided with a solvable cover in the torabgewandten side wall.

With the training of the gate with the lengthwise slot in the torabgewandten side wall of the guide rail about tormittig arranged window is from the outside accessible in the wall of the stretcher belt by the lengthwise slot, so that during this execution only a corresponding window is necessary in the torzugewandten side wall of the guide rail. Against it in accordance with the latter execution form if the lengthwise slot in the wall of the guide rail pointing downward is planned, then it is necessary in the described way to plan appropriate corresponding Fensteröffnungen in the two side walls of the guide rail so that the window for the execution of the cable, planned in the stretcher belt, is from the outside attainable to the lines in the stretcher belt.

Particularly < RTI ID=6.1> zwecEm, äBig< /RTI> is it, if the end of the chain held stationarily in relation to longitudinal movements of the gate is held at a car equipped with roles, which pushes away on the walls of the guide rail. The other end of the chain can be fastened in direct proximity of the window in the stretcher belt to the wall of the guide rail.

The design shows a remark example of the invention in schematic representation.

Show: Fig. < RTI ID=6.2> 1< /RTI> the side view of a side sliding gate in accordance with the invention, Fig. 2 in increased representation a cutout from the gate in accordance with Fig. 1 with a partial profile by the guide rail, Fig. 3 a cross section by a first execution form as box profile < RTI ID=7.1> ausgebildeter.< /RTI> Guidance, Fig would seem. 4 a cross section by another arrangement of the box shaped guide rail.

In the Fig. 1 shown side sliding gate is in the represented example as < RTI ID=7.2> freitragendes< /RTI> Schiebetor implemented, which on roller fixtures 1 pushes and is led between two posts stationary embodied in the soil on both sides the gate 2 away.

The gate exhibits a box shaped Untergurt 3, in which the conductions for control and indicator plants are intended, to those in the Fig. 1 schematically shown turn signals < RTI ID=7.3> 4< /RTI> belong, which in the Untergurt 3 of the gate can be arranged and with a movement of the gate in intervals light up. As control units can at the gate after Fig. 1 on pressure responding or if necessary, also contactless inductively working switches in the gate cross-beam 5 intended its, which can serve as limit switches for the Schliessbewegung and at the same time for the accident prevention in the case of the rear-end collision of the gate against an obstacle. The training and arrangement of such switches are actually well-known, so that it in the Fig. 1 are not in detail represented.

At a side of the lower stretcher belt 3 of the gate is one in < RTI ID=7.4> Torlängsrichtung< /RTI> running, guide rail 6 trained in form of a box profile fastened, in dargestelltn the example over the entire length of the gate sheet extends. This guide rail encloses a rectangular channel, that to on would take to one in the Fig. 1 dashed represented Ener < RTI ID=8.1> gieführungskette< /RTI> serves 7 in the form of a bar link chain from plastic and at least an electrical cable held therein.

At the post 2 one is < RTI ID=8.2> Stromzuführungseinrichtung< /RTI> 8 intended, which can be trained in form of a terminal box and by current guidance cable 9 a passed through the hollow post 2 is connected with an energy source not shown in the design.

Details < RTI ID=8.3> Energieführungskatte< /RTI> 7 in the arrangement after Fig. 1 become in connection with Fig. 2 described, which shows a partial profile in increased representation by the guide rail 6 in the way that in Fig. 1 the Beschauer turned side panel is cut off.

From the Fig. again the stationary post 2 is evident to 2 to the gate sheet with the current feed mechanism 8 designed as terminal box. The guide rail 6, which course-turned in way with it, not represented more near, side wall of the lower stretcher belt 3 are firmly connected, points on its lower surface in accordance with the representation of the cross section in Fig. 3 a continuous lengthwise slot 10 up, by through itself a pipe stationarily held 11 connected with the current feed mechanism 8 extends, which < with a stop of the energy designed as car 12; RTI ID=8.4> führungskette< /RTI> 7 is firmly connected. By the pipe 11 through extends with the current feed mechanism 8 and 9 cables 15 connected in this mechanism with the Zuführungskabel, which are passed through by the individual bar members of the energy guidance chain 7, so that it of the energy guidance chain 7 in more well-known Way is enclosed and in this chain against any external influences is kept safe. The stop of the energy guidance chain ausgetildete as car 12 is in accordance with the Fig. 2 and 3 equipped with guide rollers 13 and 14, which push on the inside of the walls of the guide rail 6 away, so that the car 12 is held during a shifting movement of the gate sheet by the pipe stationarily held 11 in its position and large friction forces between the car 12 and the Füh does not < RTI ID=9.1> rungsschiene< /RTI> 6 to arise can.

The other end of the energy guidance chain 7 is fastened with a stop 16 to the rear wall of the guide rail 6, directly beside in the wall mentioned the guide rail and hereby corresponding also in the wall of the Untergurtes 3 intended windows 17, which is taken off by a cover plate 18.

By the cover < RTI ID=9.2> 18< /RTI> and by the window 17 is in the energy guidance chain 7 cables held 15 passed through and with in the Untergurt 3 the conductions for < RTI ID=9.3> eteuerungs< /RTI> and < RTI ID=9.4> Anzeigeeinrichtun < /RTI> towards connected. < RTI ID=9.5> Fensterabdeckung< /RTI> thereby part one can do 18 < RTI ID=9.6> Klenmkastens< /RTI> form, in order to connect the electrical cable 15 with the conductions mentioned in the Untergurt 3.

The energy guidance chain 7 forms a loop, which shifts in each case according to the shifting movement of the gate within the guide rail within the guide rail 6.

The Fensteröffnung 17 is about tormittig arranged and the overall length of the energy < in the represented example; RTI ID=9.7> führungskette< /RTI> 7 in such a way measure that it corresponds for instance to the half gate length. This is the most favorable execution form, because one rungskette thereby with a relatively short Energiefüh and gets along thus also with a relatively short cable 15 for the current supply of the controllings and indicator plants of the gate.

Over the connections of the cable 15 with in the basic Untergurt 3 installed conductions make and/or. in the trouble to examine to be able, it is during the execution after Fig. 1 to 3 necessarily, also on in Fig. 1 the Beschauer course-turned to thus plan the torabgewandten side of the guide rail 6 a window with a solvable cover like it in Fig. 1 with 19 is suggested.

The dimensions of the guide rail designed as box profile depend on the strong one and pliancy of the cable 15. In dependence of it the energy guidance chain is to be selected, the radius of curvature of the loop intended for the supply of the cable 15.

An execution variant of the guide rail 6 is in Fig.

4 shown. With this training a lengthwise slot 20 is intended in the torabgewandten side of the guide rail, which < by a apron-like, flexibly; RTI ID=10.1> verformbaren< /RTI> Sealing strip 21 is taken off. By this Führungsschlitz 20 that extends somewhat differently for this than into the Fig. 1 and 2 represented pipe 11, which is connected within the guide rail 6 again with the stop 12 of the energy guidance chain 7 designed as cars. In the example of the Fig. 4 the car 12 runs in an upper chamber 22 of the guide rail 6.

During this execution that is arranged the car 12 assigned end of the energy guidance chain 7 hanging on the car in such a way that the chain comes to lie in the area underneath the chamber 22. It is <, with others; RTI ID=10.2> Worten< /RTI> only the car 12 in the chamber 22 held and led, during itself the chain in below these Chamber area present extends and there already in connection with the Fig. 1 to 3 loop specified forms, which shifts accordingly during a shifting movement of the gate.


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Requirements

1. Side sliding gate, which < one in the cross section; RTI ID=12.1> kastenförmig < /RTI> towards stretcher belt with electrical Lei do towards for control and indicator plants on and at stationary posts, arranged therein, is led, D A D u r C h g e k e n n z e i C h n e t that since lich at the stretcher belt (3) one is intended in gate longitudinal direction current guide rail (6), points which a channel for those, rectangular in the cross section

Admission of an energy guidance chain (7) in the form of a bar link chain from plastic and at least an electrical cable (15), held therein, encloses that the end of the chain is stationarily opposite along mobile gate in the guide rail led and the associated end of the cable held in the chain by a lengthwise slot (10 and/or. 20) the guidance would seem passed through and to one with the post (2) connected < RTI ID=12.2> Stromzuführungseinrichtung < /RTI> (8) angeschlossen is, while the other end of the chain is fastened to stretcher the belt and the associated end of the cable a window (17) in the wall of the stretcher belt passed through as well as with in stretcher belt intended conductions is connected, whereby the chain and the cable in the Offenstellung of the gate form a loop umschlossene of the guide rail.

2. Gate according to requirement 1, D A D u r C h g e k e n n z e i C h n e t that the window (17) in the wall of the stretcher belt (3) is about tormittig arranged and the overall length of the energy guidance chain (7) corresponds for instance to the half gate length.

3. Gate according to requirement 1 or 2, D A D u r C h g e k e n n z e i C h n e t that the guide rail (6), designed as box profile, exhibits the lengthwise slot (20) as well as in the torabgewändten side wall in downward a apron-like, flexibly ductile pointing with its free longitudinal fold

Sealing strip (21) is covered.

4. Gate according to requirement 1 or 2, D A D u r C h g e k e n n z e i C h n e t that the guide rail (6), designed as box profile, exhibits the lengthwise slot (10) in the wall pointing downward, and that in the side walls of the guide rail with that Windows (17) in the stretcher belt (of 3) aligning windows are intended, by which the window (19) is provided starting from covering in the torabgewändten side wall with a solvable.

5. Gate after one of the requirements 1 to 4, D A D u r C h g e k e n n z e i C h n e t that the end of the chain (7), stationary opposite the lengthwise-mobile gate, is held for 13,14) equipped cars (12) in one with roles (.

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